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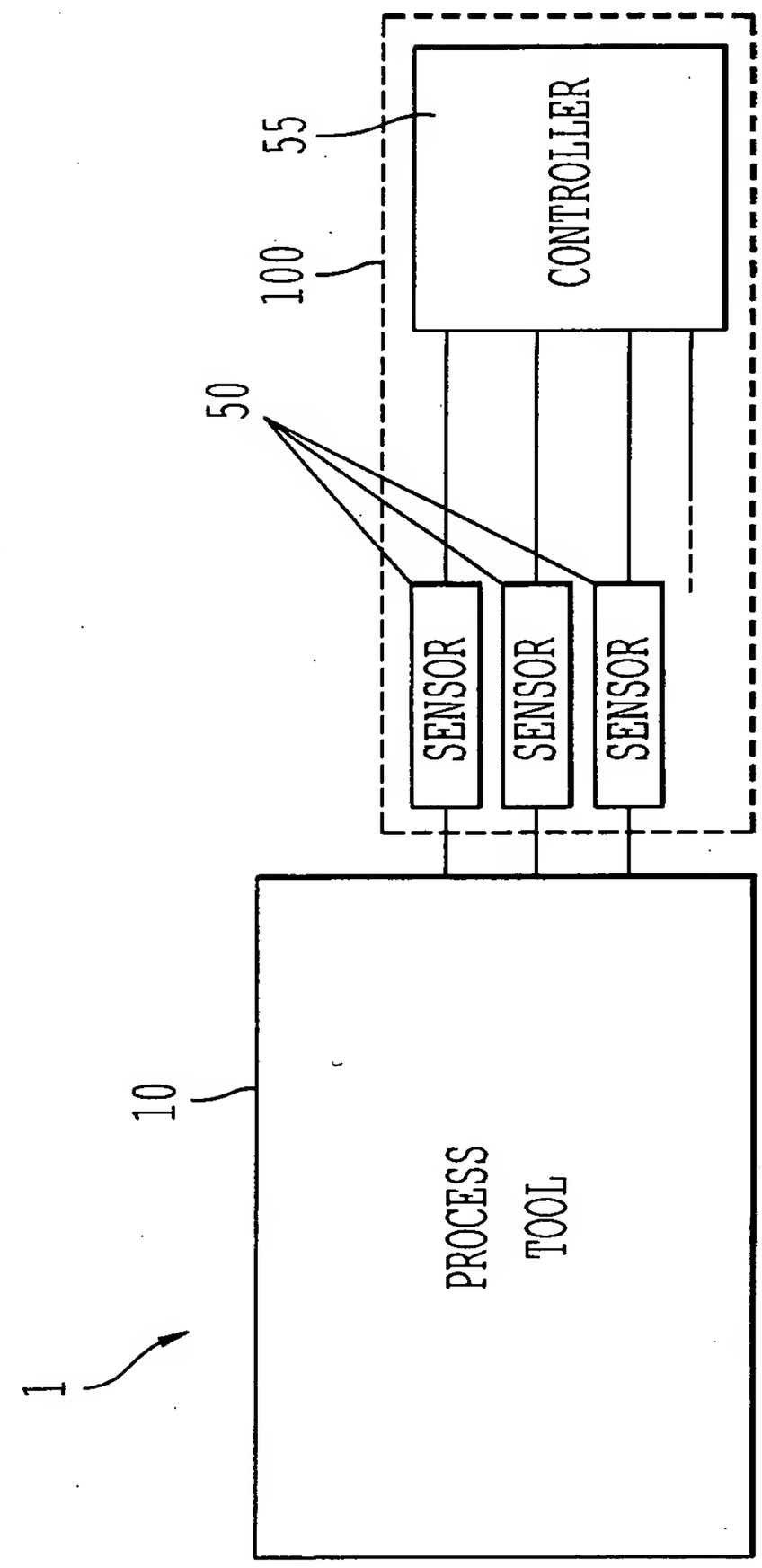



*Fig. 1*

Fig. 2

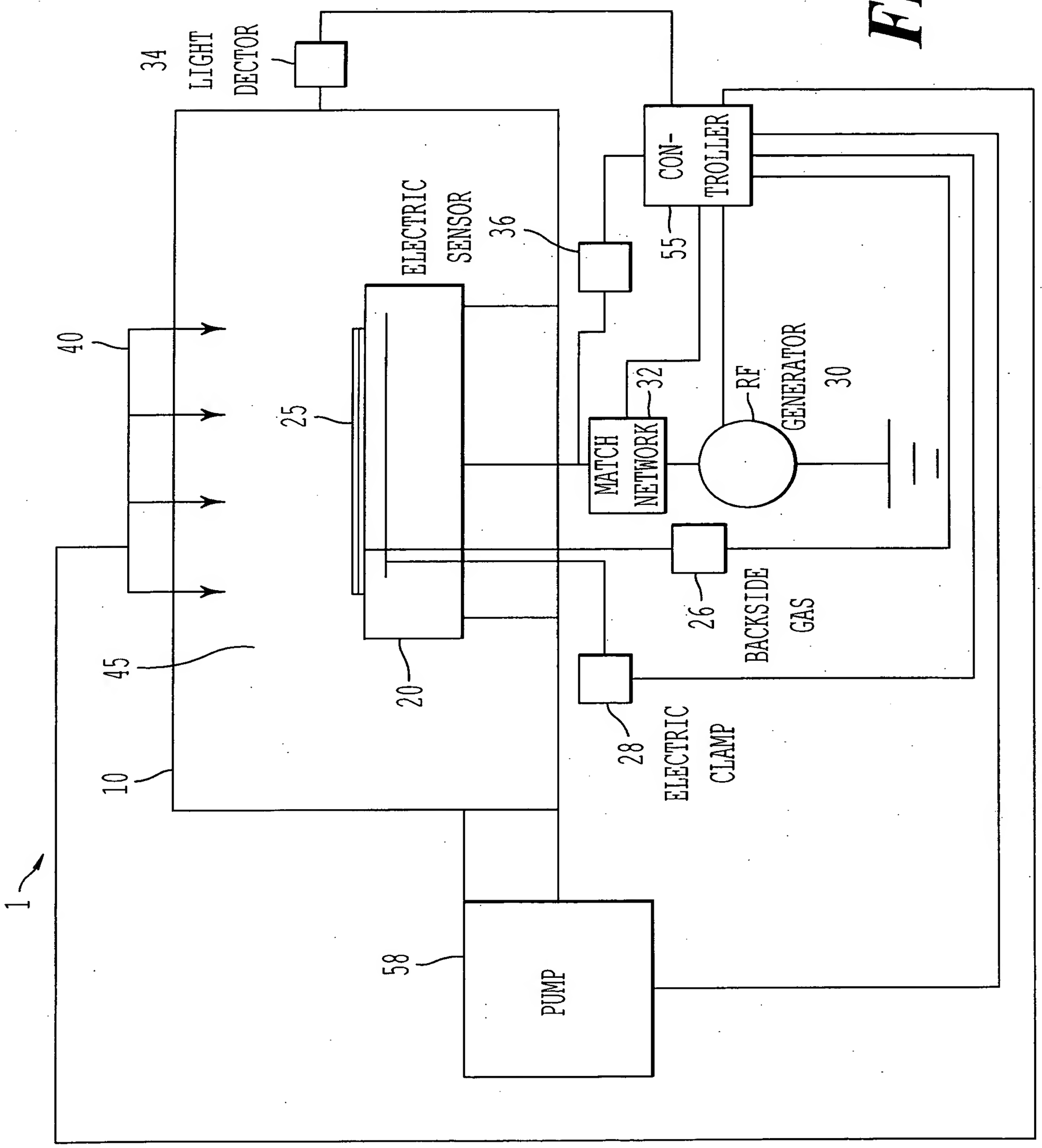

34
LIGHT DETECTOR
ELECTRIC SENSOR
36
CON-TROLLER
55
40
25
MATCH NETWORK
32
RF GENERATOR
30
45
20
26
BACKSIDE GAS
28
ELECTRIC CLAMP
10
1
58
PUMP

*Fig.3*

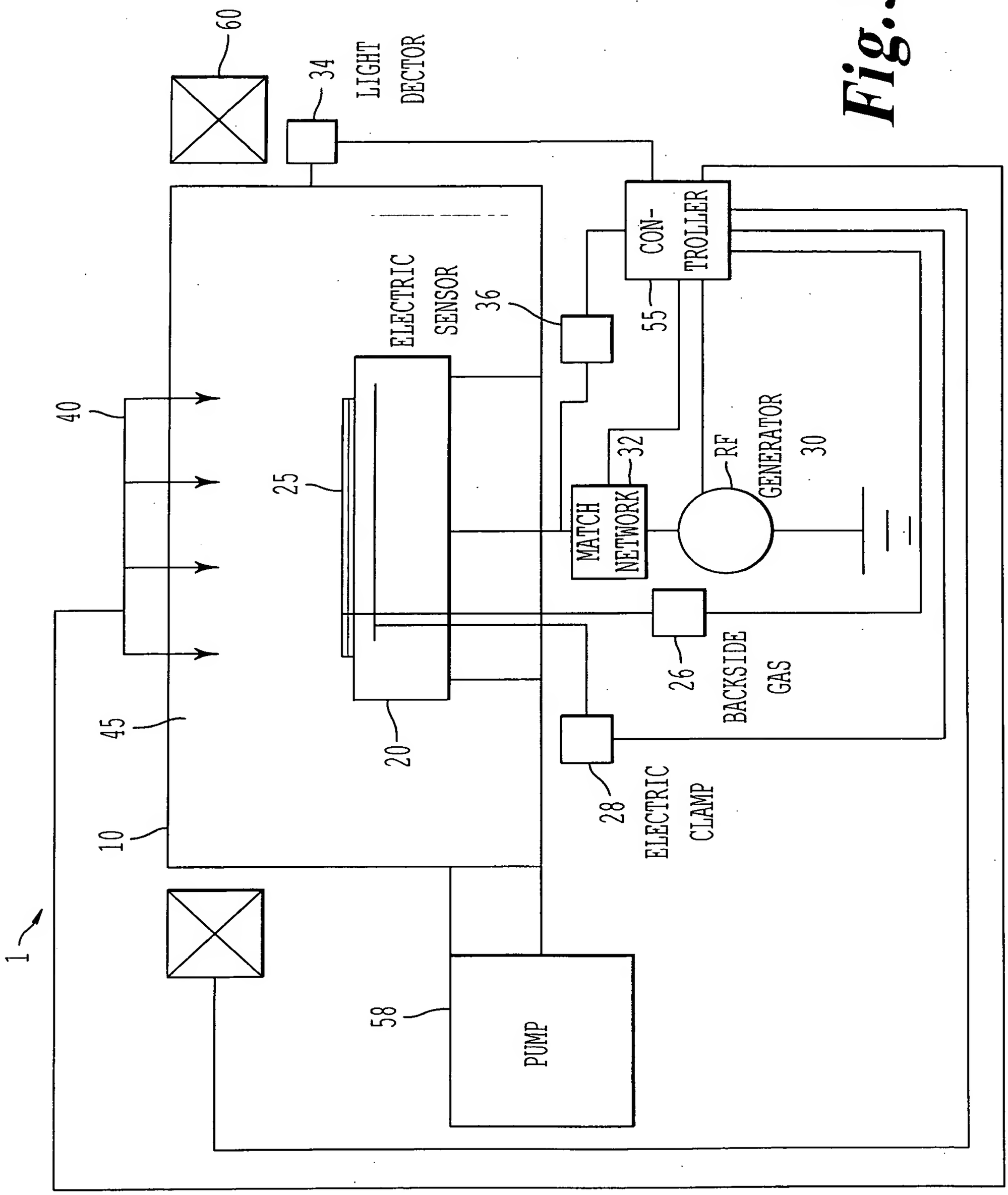
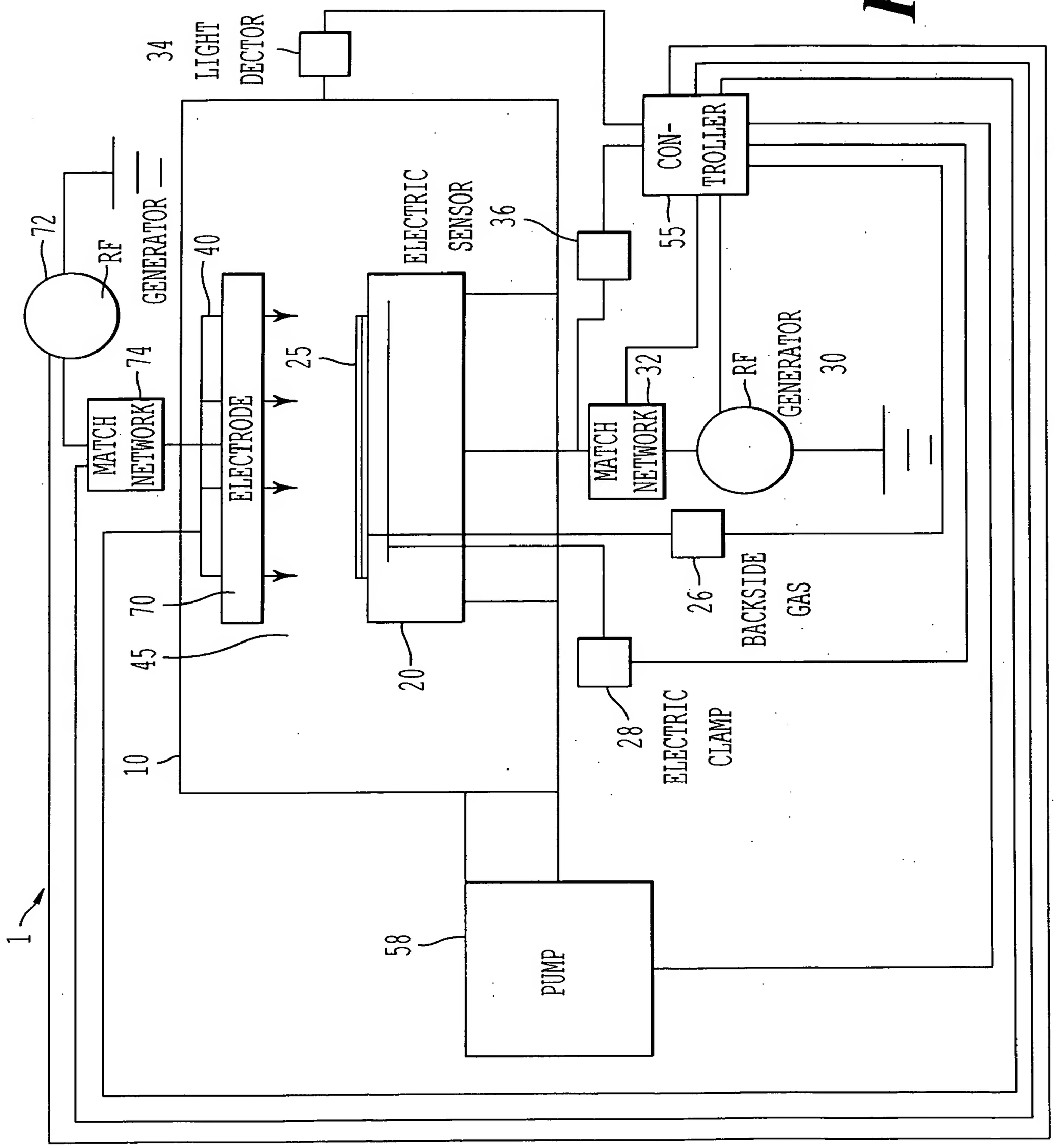

60
34
LIGHT DECTOR
ELECTRIC SENSOR
36
CON-TROLLER
55
40
25
MATCH NETWORK
32
RF GENERATOR
30
45
20
26
BACKSIDE GAS
10
28
ELECTRIC CLAMP
1
58
PUMP

Fig. 4


1
10
20
25
26
28
30
32
34
36
40
45
55
58
70
72
74
LIGHT DETECTOR
ELECTRIC SENSOR
ELECTRODE
MATCH NETWORK
RF GENERATOR
CON-TROLLER
BACKSIDE GAS
ELECTRIC CLAMP
PUMP

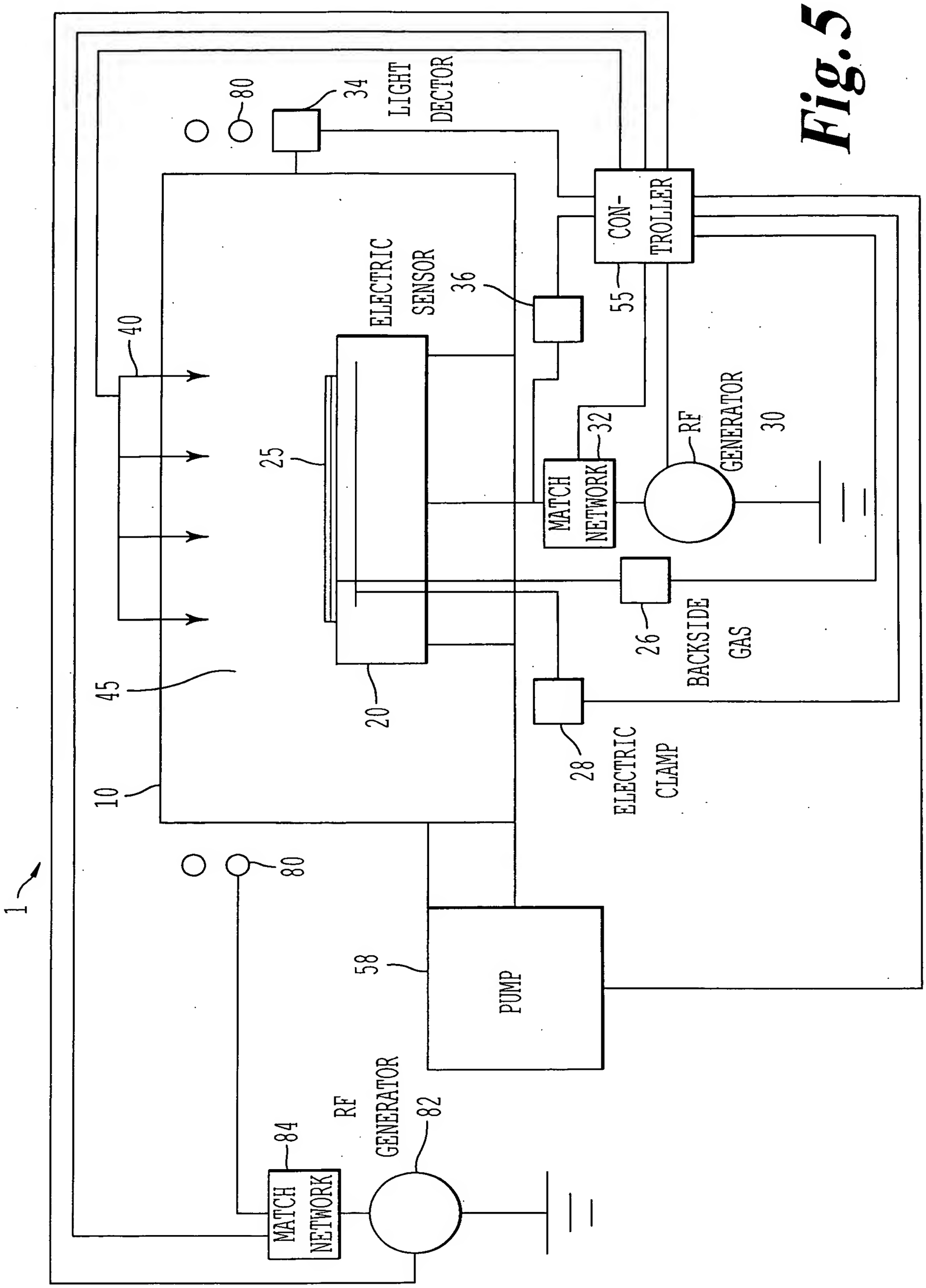

1
10
20
25
26
28
30
32
34
36
40
45
55
58
80
82
84
LIGHT DECTOR
ELECTRIC SENSOR
CON-TROLLER
MATCH NETWORK
RF GENERATOR
BACKSIDE GAS
ELECTRIC CLAMP
PUMP
MATCH NETWORK
RF GENERATOR

Fig.5

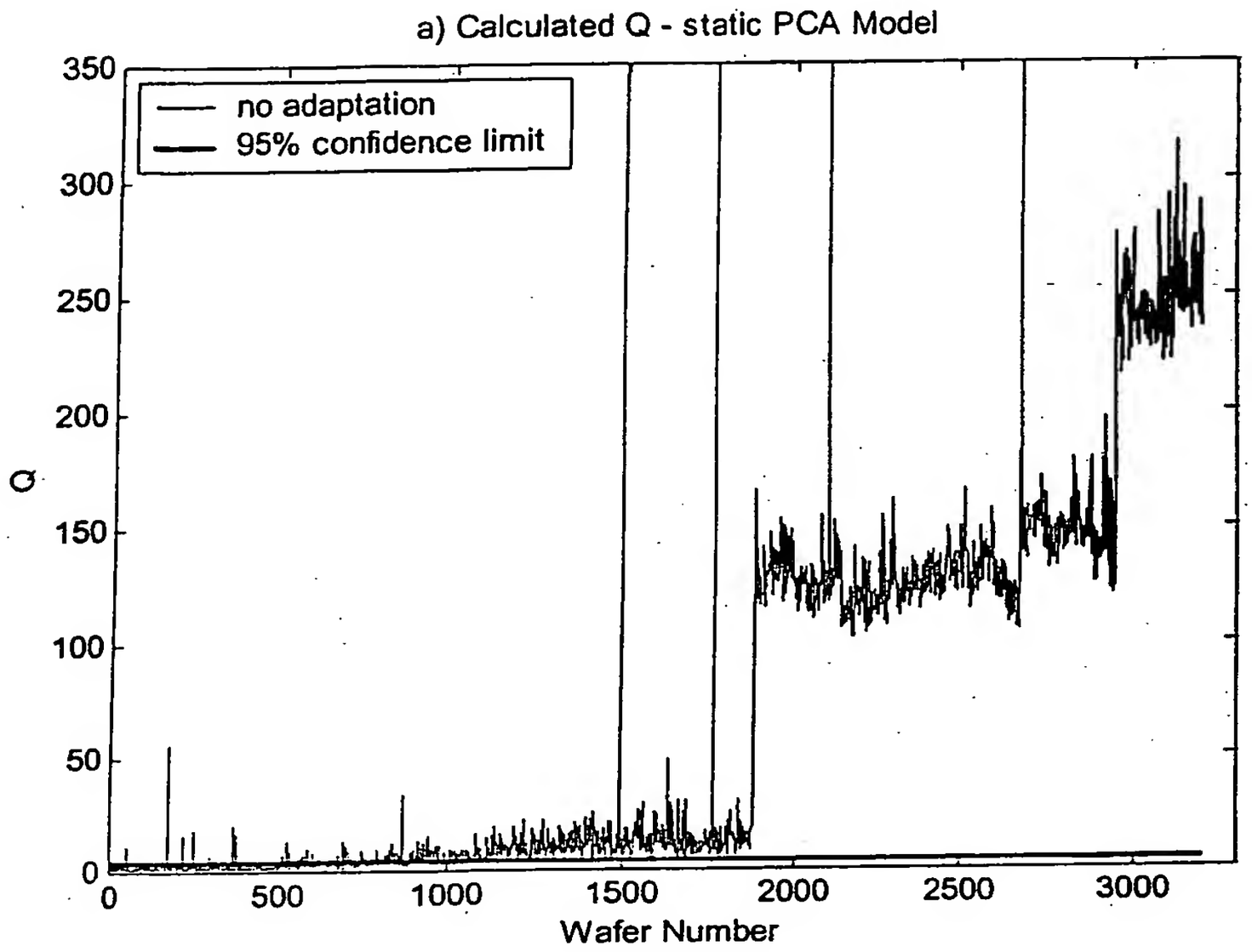

a) Calculated Q - static PCA Model
no adaptation
95% confidence limit
Q
Wafer Number
0
50
100
150
200
250
300
350
0
500
1000
1500
2000
2500
3000

*Fig. 6A*

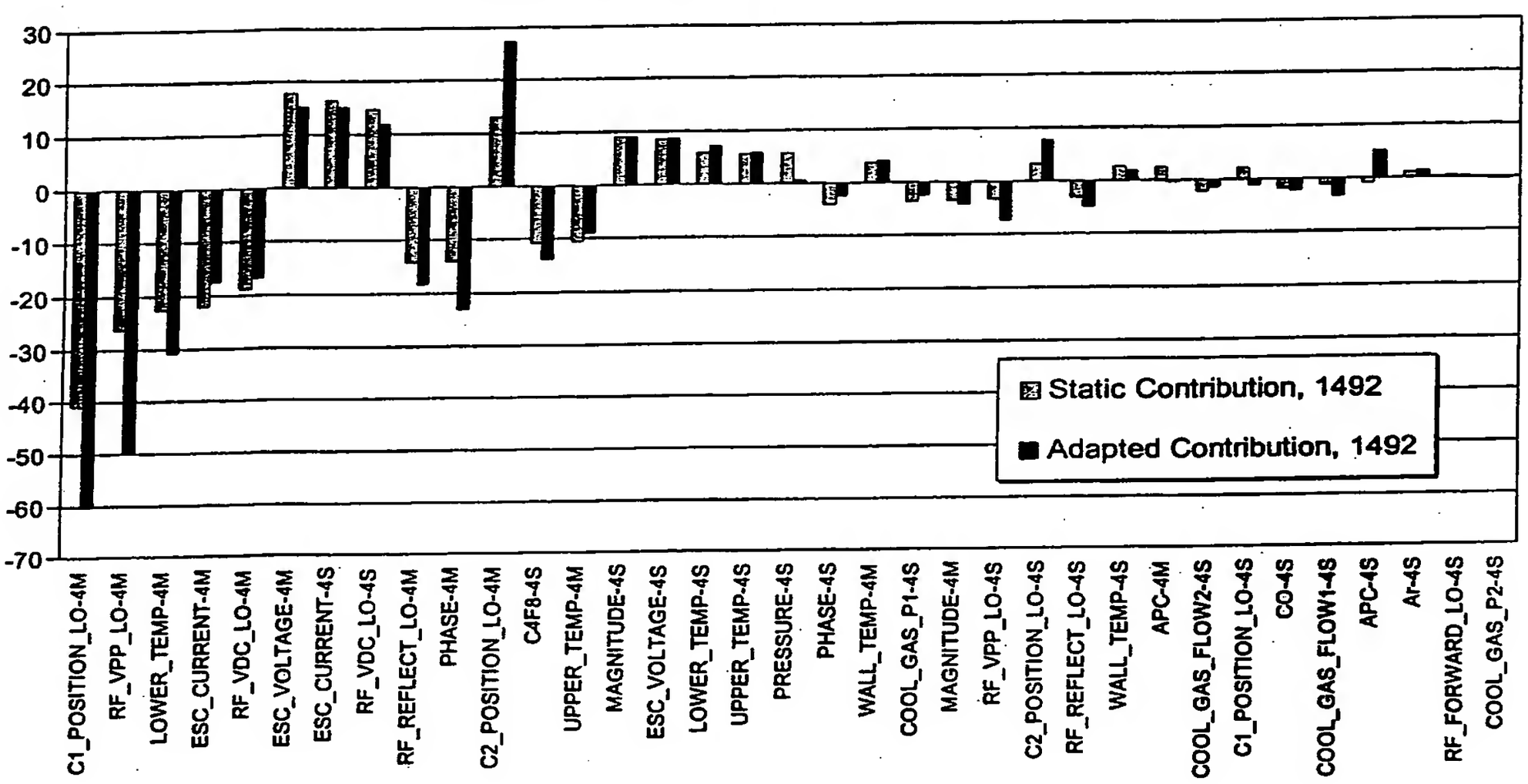

EXEMPLARY Q CONTRIBUTION PLOT
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
Static Contribution, 1492
Adapted Contribution, 1492
C1_POSITION_LO-4M
RF_VPP_LO-4M
LOWER_TEMP-4M
ESC_CURRENT-4M
RF_VDC_LO-4M
ESC_VOLTAGE-4M
ESC_CURRENT-4S
RF_VDC_LO-4S
RF_REFLECT_LO-4M
PHASE-4M
C2_POSITION_LO-4M
C4F8-4S
UPPER_TEMP-4M
MAGNITUDE-4S
ESC_VOLTAGE-4S
LOWER_TEMP-4S
UPPER_TEMP-4S
PRESSURE-4S
PHASE-4S
WALL_TEMP-4M
COOL_GAS_P1-4S
MAGNITUDE-4M
RF_VPP_LO-4S
C2_POSITION_LO-4S
RF_REFLECT_LO-4S
WALL_TEMP-4S
APC-4M
COOL_GAS_FLOW2-4S
C1_POSITION_LO-4S
C0-4S
COOL_GAS_FLOW1-4S
APC-4S
Ar-4S
RF_FORWARD_LO-4S
COOL_GAS_P2-4S

*Fig. 7*

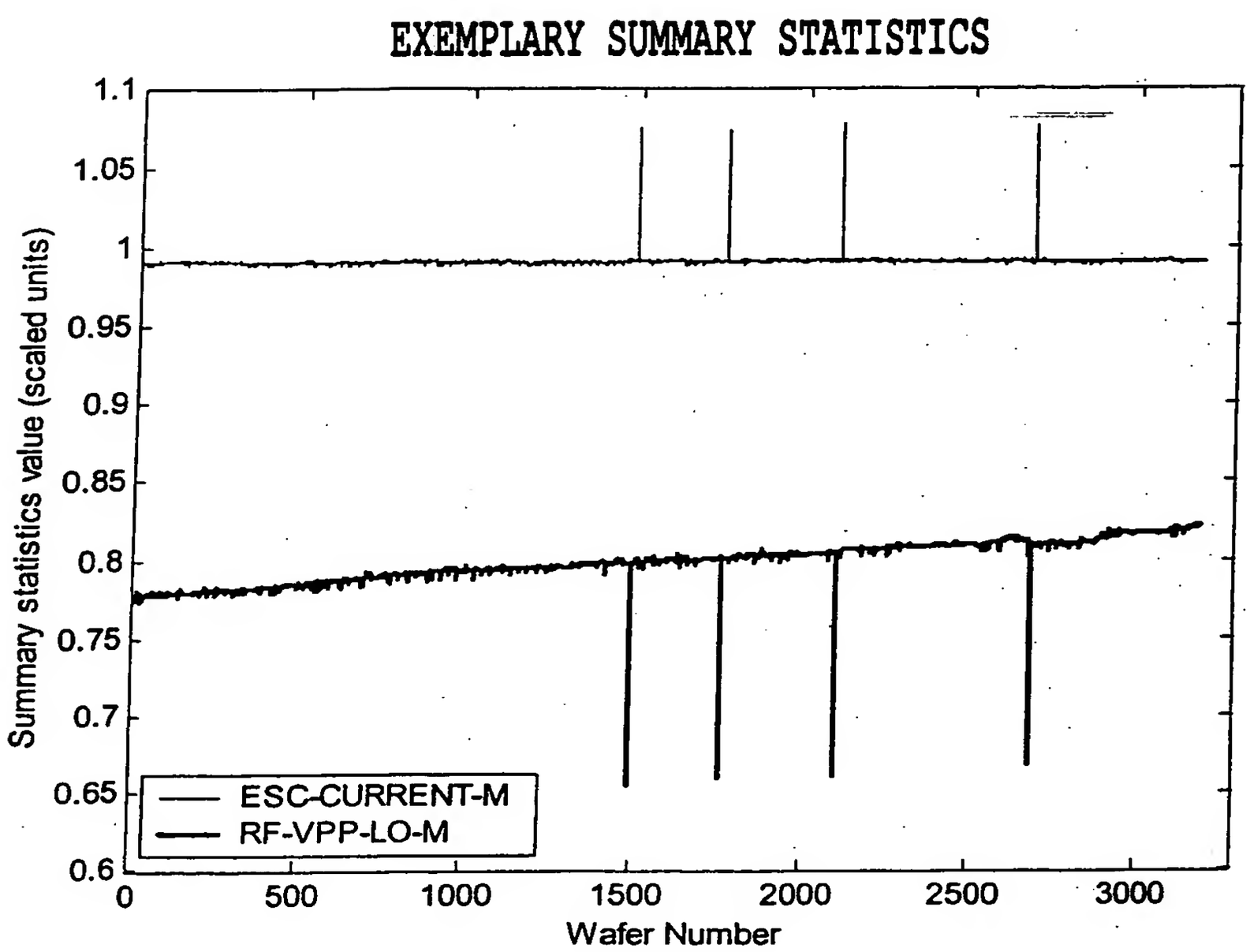

EXEMPLARY SUMMARY STATISTICS
Summary statistics value (scaled units)
1.1
1.05
1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0
500
1000
1500
2000
2500
3000
Wafer Number
ESC-CURRENT-M
RF-VPP-LO-M

*Fig. 8*

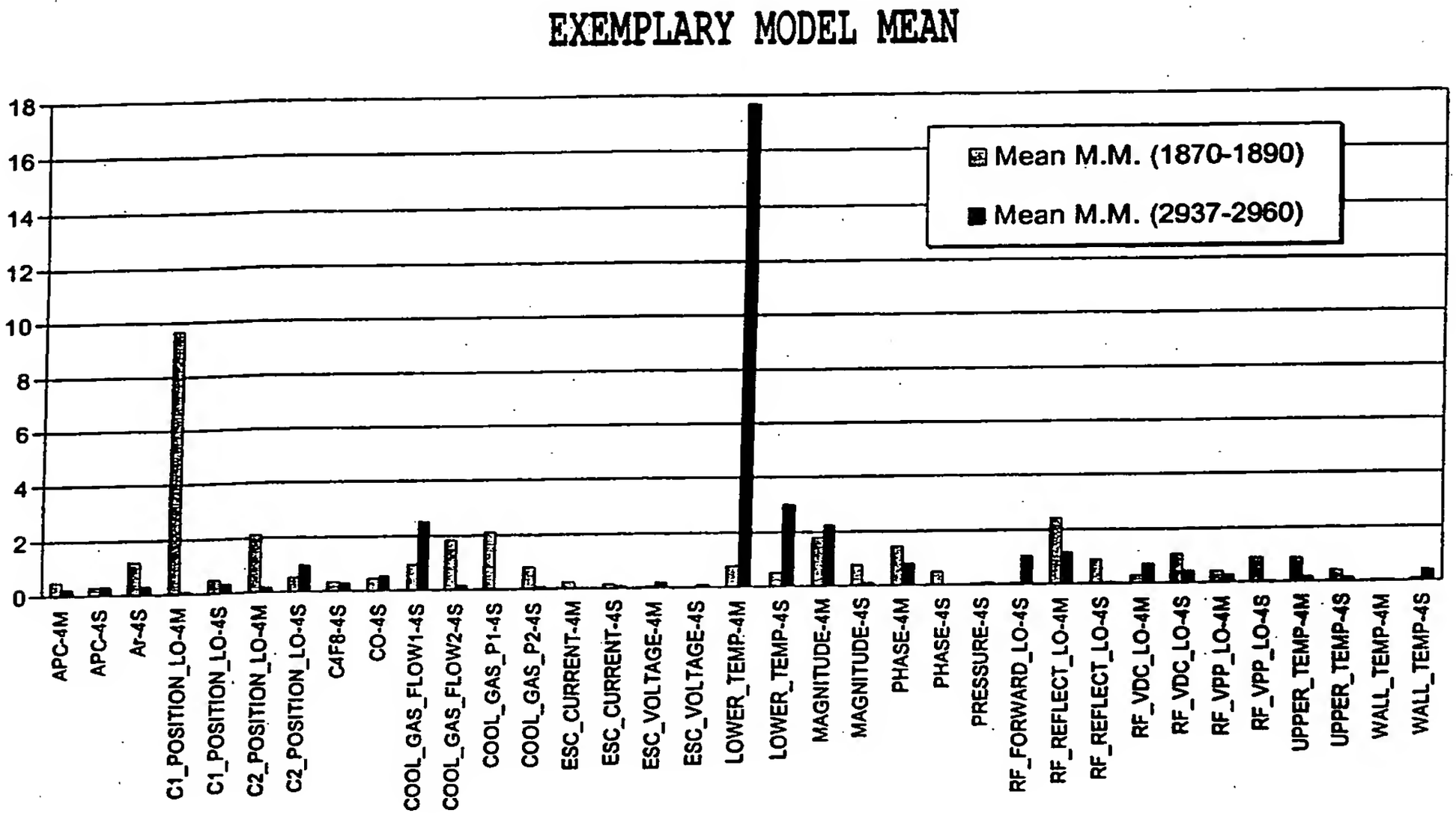

EXEMPLARY MODEL MEAN
Mean M.M. (1870-1890)
Mean M.M. (2937-2960)
0
2
4
6
8
10
12
14
16
18
APC-4M
APC-4S
Ar-4S
C1_POSITION_LO-4M
C1_POSITION_LO-4S
C2_POSITION_LO-4M
C2_POSITION_LO-4S
C4F8-4S
CO-4S
COOL_GAS_FLOW1-4S
COOL_GAS_FLOW2-4S
COOL_GAS_P1-4S
COOL_GAS_P2-4S
ESC_CURRENT-4M
ESC_CURRENT-4S
ESC_VOLTAGE-4M
ESC_VOLTAGE-4S
LOWER_TEMP-4M
LOWER_TEMP-4S
MAGNITUDE-4M
MAGNITUDE-4S
PHASE-4M
PHASE-4S
PRESSURE-4S
RF_FORWARD_LO-4S
RF_REFLECT_LO-4M
RF_REFLECT_LO-4S
RF_VDC_LO-4M
RF_VDC_LO-4S
RF_VPP_LO-4M
RF_VPP_LO-4S
UPPER_TEMP-4M
UPPER_TEMP-4S
WALL_TEMP-4M
WALL_TEMP-4S

*Fig.9A*

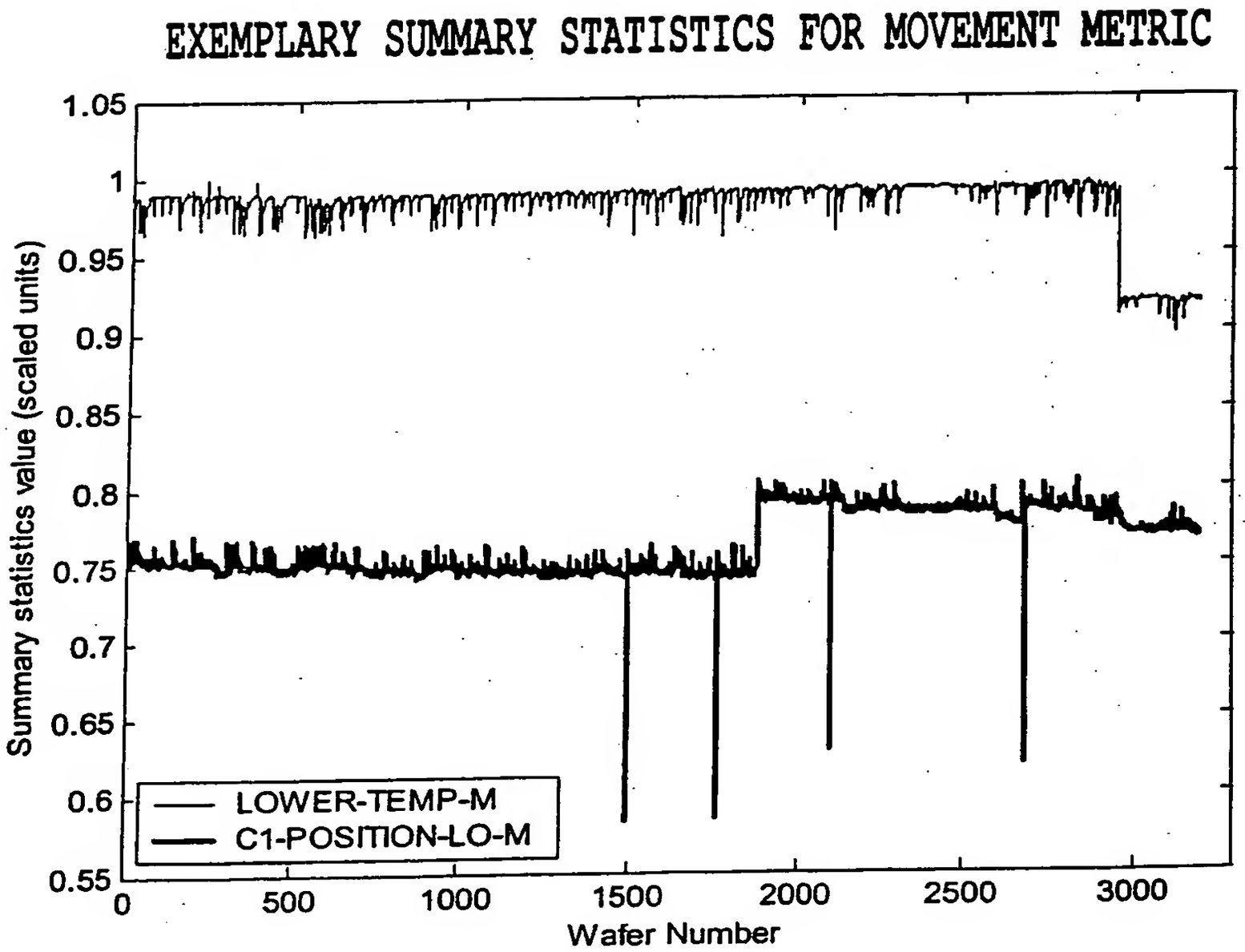

EXEMPLARY SUMMARY STATISTICS FOR MOVEMENT METRIC
Summary statistics value (scaled units)
Wafer Number
LOWER-TEMP-M
C1-POSITION-LO-M
1.05
1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0
500
1000
1500
2000
2500
3000

*Fig. 9B*